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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,031	01/12/2005	Robert H Murphy	20020001-US	6558
22500	7590	04/28/2010		
BAE SYSTEMS PO BOX 868 NASHUA, NH 03061-0868			EXAMINER NGUYEN, LUONG TRUNG	
			ART UNIT 2622	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/521,031

Applicant(s)

MURPHY ET AL.

Examiner

LUONG T. NGUYEN

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-13, 15, 16 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-13, 15, 16 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-4, 8-13, 15-16, 21-22 and newly added claims 23-24 filed on 01/27/2010 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 1-4, 8-9, 23-24 are objected to because of the following informalities:

Claim 1 (line 16), "the lens to by detected" should be changed to --the lens to be detected--.

Claim 23 (line 2), claim 24 (line 2), "the lens" should be changed to --the lens.--.

Claims 2-4, 8-9, 23-24 are objected as being dependent from claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 1-4, 8-13, 15-16, 21-22, 23-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 1, claim 1 is amended with newly added limitation “infra-red radiation emitted by the lens” on (lines 9-10, 15-16). The specification does not have support for this newly added limitation.

Regarding claim 10, claim 10 is amended with newly added limitation “infra-red radiation emitted by the lens” on (lines 6, 14, and 20). The specification does not have support for this newly added limitation.

Regarding claim 15, claim 15 is amended with newly added limitation “infra-red radiation emitted by the lens” on (lines 7, 12-13, and 15). The specification does not have support for this newly added limitation.

Claims 2-4, 8-9, 23-24 are rejected as being dependent from claim 1.

Claims 11-13 are rejected as being dependent from claim 10.

Claims 16, 21-22 are rejected as being dependent from claim 15.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 8-13, 15-16, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindgren et al. US (5,420,421) in view of Medina (US 5,081,530) further in view of Bakhle et al. (US 6,061,092).

Regarding claim 1, Lindgren et al. discloses a thermal imaging based system (infrared imaging device 10, figure 1, see abstract, column 4, lines 12-26) adapted for imaging infra-red radiation that is emitted by a black body, the thermal imaging based system comprising:

focal plane array (FPA) having a plurality of pixels sensitive to infra-red radiation (focal plane array 16, figure 1, column 3, lines 30-47; column 4, lines 12-26);

a lens (optical system 12, figure 1, column 3, lines 30-47) disposed between the black body and the FPA and adapted to focus the infra-red radiation emitted by the black body in front of the lens onto the FPA behind the lens, the plurality of pixels of the FPA having sufficient infra-red sensitivity so as to detect the infra-red radiation emitted by the black body as well as infra-red radiation emitted by the lens;

a signal processing module (electronics unit 18, figure 1, column 3, lines 40-53) operatively coupled to the FPA.

Lindgren et al. fails to specifically disclose a shutter located between the lens and the black body, the shutter having a closed state and an open state wherein the closed state prevents the infra-red radiation emitted by the black body from reaching the FPA while allowing the infra-red radiation emitted by the lens to be detected by the FPA as a reference image signal, and the open state allows both the infra-red radiation emitted by the black body and the infra-red radiation emitted by the lens to be detected by the FPA as an open state image signal.

However, Medina teaches a camera, which also discloses a focal plane array (sensor 26, figure 2, column 1, lines 49-58; column 3, lines 54-67) having a plurality of pixels sensitive to heat radiation; Medina discloses the shutter 24 is located between lens 25 and the scene of object 22. The opening and closing of the shutter 24 in accordance with the cycle of waveform 30 is controlled by a signal derived from waveform 28 (figure 2, column 3, line 62 to column 4, line 31). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Lindgren et al. by the teaching of Medina in order to detect the phase of light source reaching an image sensor by using a shutter that opens and closes in synchronization with the pulse light source (column 2, lines 35-42).

Lindgren et al. and Medina fail to disclose a signal processing module operatively coupled to the FPA, and adapted to correct the open state image signal based on the reference image signal.

However, Bakhle et al. discloses a digital camera system 10, the digital camera 10 comprises a shutter (shutter 12, figures 1A-1B, column 1, line 50 – column 2, line 13; the shutter 12 is located between the CMOS image sensor array 18 and a scene in front of lens 16), the shutter having a closed state and an open state; a signal processing module (dark image subtraction unit 22, figures 1A-1B, column 1, line 50 – column 2, line 13) operatively coupled to the FPA, and adapted to correct the open state image signal based on the reference image signal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Lindgren et al. and Medina by the teaching of Bakhle et al. in order to provide non-uniformity compensation for infrared focal plane array

response over a wide dynamic range of signal flux levels of infrared radiation, such as a “cold” sky and “hot” terrain (column 2, lines 55-59).

Regarding claim 2, Bakhle et al. discloses a shutter controller (solenoid 14, figures 1A-1B) operatively coupled to the shutter, and adapted to command the shutter to its opened and closed states.

Regarding claim 3, Bakhle et al. discloses a system controller communicatively coupled to the shutter controller and the signal processing module, and adapted to control operation of the imaging system (a system controller is included in digital camera 10 to control operation of digital camera 10, figures 1A-1B).

Regarding claim 4, Bakhle et al. discloses the system controller is communicatively coupled to a network thereby enabling the imaging system to communicate with other systems also communicatively coupled to the network (Bakhle et al. discloses video camera is coupled to a personal computer through a bus interface, column 2, lines 15-28).

Regarding claim 8, Bakhle et al. discloses wherein for any one session of imaging system operation, each of a plurality of open state image signals are corrected for pixel-to-pixel non-uniformities and offset based on the open and closed state image signal (column 1, line 50 – column 2, line 28).

Regarding claim 9, Bakhle et al. discloses wherein the closed state image signal is periodically generated to account for changes in the imaging system (column 7, lines 19-28).

Regarding claim 10, claim 10 is a method claim of apparatus claim 1; therefore, see examiner's comment regarding claim 1.

Regarding claim 11, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for pixel-to-pixel non-uniformities of the FPA (column 1, line 50 – column 2, line 13).

Regarding claim 12, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for offsets between the opened and closed states of the shutter (column 1, line 50 – column 2, line 13).

Regarding claim 13, Bakhle et al. discloses wherein correcting the open state image signal includes compensating for pixel-to-pixel non-uniformities and offsets between the opened and closed states of the shutter (column 1, line 50 – column 2, line 13).

Regarding claims 15-16, all the limitation of claims 15-16 are included in claim 1; therefore, see examiner's comment regarding claim 1.

Regarding claim 21, see examiner's comment regarding claim 2.

Regarding claim 22, see examiner's comment regarding claim 3.

7. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindgren et al. (US 5,420,421) in view of Medina (US 5,081,530) and Bakhle et al. (US 6,061,092) further in view of Sato (US 6,181,484).

Regarding claims 23, Lindgren et al., Medina and Bakhle et al. fail to specifically disclose wherein the shutter has a lens side surface that is located within five millimeters of a front side of the lens. However, Sato teaches the shutter 2 is disposed at a position which is distanced from the imaging-side surface of the lens L2 by 1.97 mm toward the image side (column 4, lines 48-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the device in Lindgren et al., Medina and Bakhle et al. by the teaching of Sato in order to provide a compact camera.

Regarding claims 24, Lindgren et al., Medina and Bakhle et al. fail to specifically disclose wherein the shutter has a lens side surface that is located within one millimeters of a front side of the lens. However, Sato teaches the shutter 2 is disposed at a position which is distanced from the imaging-side surface of the lens L2 by 1.97 mm toward the image side (column 4, lines 48-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the device in Lindgren et al., Medina and Bakhle et al. by the teaching of Sato in order to provide a compact camera.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/
Primary Examiner, Art Unit 2622
04/24/10